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MALAYSIA: 100 YEARS OF RESILIENT PALM OIL ECONOMIC PERFORMANCE

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ABSTRACT

The oil palm industry in Malaysia started about 100 years ago in a modest way. It was first introduced to Malaya (now Malaysia) as a commercial plant in 1917 at the Tennamaram Estate in Selangor, which effectively laid the foundation for the development of the oil palm industry in Malaysia. The oil palm planted area had expanded phenomenally from a mere 55 000 ha in 1960, to 5.74 million hectares in 2016. In tandem with the area expansion, the production of palm oil also grew significantly from less than 100 000 t in 1960 to about 17.32 million tonnes in 2016. From a humble beginning in 1960, the Malaysian oil palm industry has transformed to become one of the key contributors to the Malaysia's Gross Domestic Product (GDP), foreign exchange earnings and creation of employment opportunities. Likewise, exports of palm oil also witnessed a sharp increase from 1.17 million tonnes in 1975 to 16.05 million tonnes in 2016. From merely depending on Europe as its main export destination in the early years, Malaysia has now expanded its export markets to more than 200 markets worldwide, which included the Indian sub-continent, the West Asia, Africa and Asia. In this regard, the type of export products also dramatically changed from depending on crude palm oil (CPO) (100%) to a myriad of processed palm oil products (99%) to cater to the ever increasing demand of consumers. On average, the industry contributes 5% to 7% of the country's GDP, with export revenue for the last five years averaging at RM 64.24 billion annually. Despite attaining significant achievements in both its palm oil production and exports, Malaysia is currently facing issues of the limited arable land and labour shortage, which can affect the continued growth of the oil palm industry. Compounding this problem further, is the strong pressure exerted by non-governmental organisations (NGO) on issues of environment and so-called claims of protecting consumers' health. It is precisely for this that the Transformasi Nasional 50 *(TN50) programme envisages the adoption of mechanisation to address the issue of labour shortage and producing higher yielding clonal planting materials on a commercial basis to increase oil palm productivity. On the issue of confronting negative allegation against palm oil, continued efforts in branding palm oil as an environmentally sustainable palm oil through the adoption of the Malaysian sustainable palm oil throughout the value chain is deemed as the game changer for the industry in the future.*

Keywords: economic performance, palm oil, production, export, price, sustainability, biodiesel, labour.

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INTRODUCTION

The article is written to commemorate the 100 years of the oil palm industry in Malaysia when it was first introduced as a commercial plant in 1917 at the Tennamaram Estate in Selangor. Today, the oil palm industry has become one of the major key contributors to the Malaysian economy. The article highlights salient points related to the development of the oil palm industry such as planted area, production, exports, price as well as issues and challenges.

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The oil palm (*Elaeis guineensis*) is indigenous to West Africa, where it is found in the region between Angola and Gambia. It was introduced to South-east Asia when planted at the Bogor Botanical Garden, Indonesia, in 1848. In the 1870s, Malaya received its first batch of oil palm from the Royal Botanic Gardens in Kew, England, where it was planted at the Singapore Botanic Garden. Its appearance made it suitable for use as an ornamental plant. Soon, oil palm became a common sight along major roads, in front of government buildings and in public parks. The 19th century Industrial Revolution in Europe prompted many young entrepreneurs, including a young Frenchman Henri Fauconnier, to travel to East Asia to make their fortunes. In 1905, Fauconnier arrived in Malaya and months later established a coffee plantation with his friends in Rantau Panjang, Selangor. When rubber and coffee prices began depreciating, he planted oil palm at Tennamaram Estate in Batang Berjuntai, Selangor, in 1917. This first commercial oil palm estate laid the foundation for the development of Malaysia's palm oil industry (NST, 2017).

After independence in 1957, the Malaysian government faced a huge challenge in redistributing economic wealth among the people. While those in urban areas enjoyed a good quality of life, there was rampant poverty in rural areas. Expansion of agriculture was considered a major priority to bridge the gap and improve the livelihood of the rural poor. The government established the Federal Land Development Authority (Felda) to take on that formidable challenge through a policy of providing 'land for the landless, jobs for the jobless' (NST, 2017). From a mere 55 000 ha in 1960, the oil palm planted area expanded remarkably to 5.74 million hectares in 2016. In tandem with the area expansion, production of palm oil grew significantly from less than 100 000 t in 1960 to about 17.32 million tonnes in 2016.

The introduction of the weevils in the oil palm pollination process has contributed to the increase in the Malaysia's palm oil production. Prior to 1981, the national average fresh fruit bunches (FFB) in Malaysia was low *i.e.* less than 19 t ha^{-1} yr^{-1}. Hand-assisted pollination became necessary to increase the yield, but this was laborious and costly. The introduction of *Elaeidobius kamerunicus* weevil, which is a pollinating insect from Cameroon, at the Mamor Estate in Kluang, Johor in 1981 was a turning point for the Malaysian oil palm industry. Its introduction into the oil palm plantations has increased the FFB yield per hectare tremendously as well as save the cost of pollination.

In line with the increase in palm oil production, the export of palm oil also increased from less than 100 000 t in 1960 (PORLA, 1999) to 16.05 million tonnes in 2016. From merely depending on Europe as its main export destination in the early years, Malaysia has now expanded its export markets to more than 190 markets worldwide, which included the Indian sub-continent, West Asia, Africa and Asia. In this regard, the type of export products also dramatically changed from depending on crude palm oil (CPO) (100%) to a myriad of processed palm oil products (99%) to cater to the ever increasing demand of consumers.

The success in the oil palm industry has made the Malaysian oil palm industry to be one of the key contributors to the Malaysia's Gross Domestic Product (GDP), foreign exchange earnings and creation of employment opportunities. On average, the industry contributes 5% to 7% of the country's GDP, with export revenue for the last five years averaging at RM 64.24 billion annually. In 2016, export revenue generated from the oil palm industry was RM 67.6 billion, which equals to 6.1% of total Malaysia's GDP.

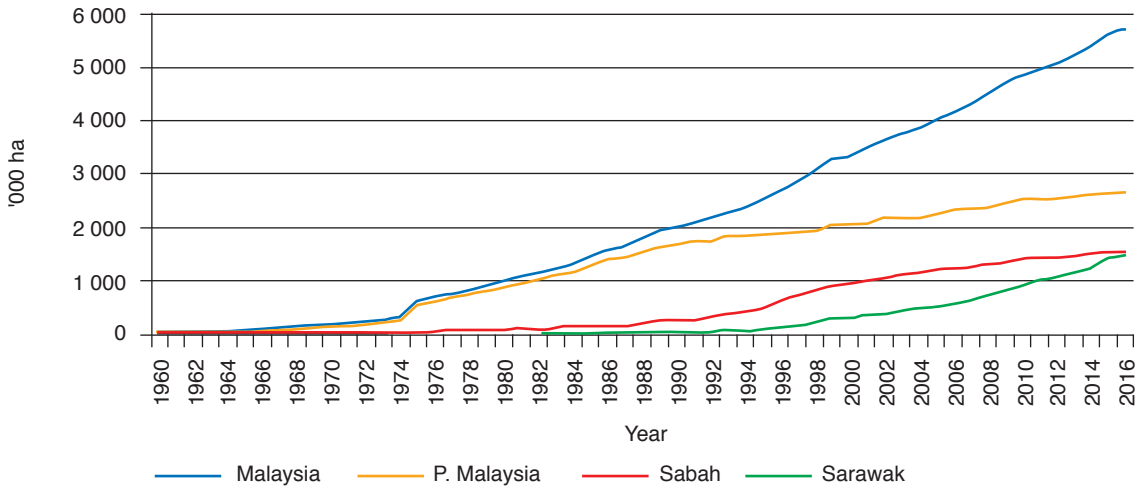
As a sustainable crop, the oil palm plays a critical role in helping to feed more than three billion people in over 200 countries. Feeding an additional two billion people by 2050 with limited arable land will be no small task. Compared with other oil bearing crops, oil palm is a highly efficient producer of vegetable oil. It needs less land, only 0.26 ha, to produce 1 t of oil compared with 2.2, 2.0 and 1.5 ha for soyabean, sunflower and rapeseed respectively (Wahid *et al*., 2011). In 2016, Malaysia produced 29.4% of the global palm oil output from a mere 0.1% of global agricultural land. With improvements in processing technologies, it can be easily tailored to meet specifications of end-users. It is highly sought after for various applications in food and non-food industries, making it a true global product (NST, 2017).

INDUSTRY PERFORMANCE

Planted Area

The oil palm planted area in Malaysia has shown dramatic growth from a mere 55 000 ha in 1960 to 193 000 ha in 1970. The development was remarkable with the planted area reaching 1.02 million hectares in 1980 and subsequently expanding to 2.03 million hectares in 1990 and further to 5.74 million hectares in 2016 (MPOB, 2017a). In recent years, most of the expansion took place in Sabah and Sarawak due to declining availability of suitable land in Peninsular Malaysia. In 2016, about 47% of the planted area is in Peninsular Malaysia, 27% in Sabah and 26% in Sarawak.

Major expansion in the oil palm planted area took place during 1960s and 1970s as a result of the policy of agricultural transformation as more land was converted from rubber to oil palm due to the downtrend of the rubber prices. In addition, the



Source: MPOB (2017a).

Figure 1. Oil palm planted area.

infrastructure requirement for oil palm plantation is similar with rubber thus the cost of transition was reasonably low and furthermore palm oil has proven to be more profitable than rubber. As a result, the oil palm planted area expanded widely in estates as well as the opening of new land areas, especially under the government schemes (Hamid and Arshad, 2007).

At the early stage, the government established Felda in 1956 with the purpose to uplift the economic status as well as living standard of the rural community. Felda had allocated selected settlers with their family from among the rural poor and landless community in a new settlement area. As to-date, Felda has developed approximately 282 settlements for oil palm area covering 394 000 ha.

This was followed by establishment of the Federal Land Consolidation and Rehabilitation Authority (Felcra) in 1966 with the objective to reduce and eliminate inter-racial economic gaps in the country. Among the goals, set up by Felcra is to create job opportunities, improve economic standards and increase productivity. In implementing its functions, Felcra has undertaken three types of projects, namely Rehabilitation Plan, Rural Land Plan and Youth Land Plan. Felcra has managed nearly 161 Rehabilitation Plan for 150 000 ha of oil palm area.

The Rubber Industry Smallholders Development Authority (RISDA) was later established in 1973 with the aim to increase smallholder income where they are encouraged to venture into agricultural and non-agricultural industries by implementing small-scale plantation or social development programs through various projects to reduce the economic disparity of small-scale sector compared to other sectors. Up until now, RISDA has handle almost 50 mini estates under oil palm totalling 26 000 ha. Subsequently, another era emerged with big plantation companies such as Golden Hope Plantation, Guthrie, Sime Darby, PPB Oil Palms, Wilmar, Kuala Lumpur Kepong and IOI Group becoming major players in oil palm plantation.

In 2016, private estates accounted for the largest planted area of 3.51 million hectares, covering 61.2%, followed by independent smallholders with 0.93 million hectares (16.3%), Felda with 0.71 million hectares (12.3%), state schemes with 0.34 million hectares (6.0%), Felcra with 0.17 million hectares (3.0%) and RISDA with 0.07 million hectares (1.2%) (*Table 1*).

Production

CPO production in Malaysia has grown rapidly and currently has emerged as one of the main agricultural commodities in Malaysia and contributing significantly to the national income. The rapid expansion of the oil palm planted

TABLE 1. OIL PALM PLANTED AREA ACCORDING TO CATEGORY, 2016 (ha)

Category	ha	%
Private estates	3 508 554	61.2
Government schemes:		
Felda	706 588	12.3
Felcra	173 032	3.0
RISDA	71 549	1.2
State schemes	344 314	6.0
Independent smallholders	933 948	16.3
Malaysia	5 737 985	100

Note: Felda – Federal Land Development Authority.
Felcra - Federal Land Consolidation and Rehabilitation Authority.
RISDA – Rubber Industry Smalholders Development Authority.
Source: MPOB (2017a).

area contributes to the increase in FFB and CPO production. According to Abdullah (2003), there are some major factors that affect the CPO production, such as oil palm planted area, matured area, replanting and yield.

In 1960, Malaysia produced about 92 000 t of CPO. However, after six years, Malaysia's CPO production increased significantly to become the world's largest exporter of palm oil, overtaking Indonesia, Nigeria and the Belgian Congo (Toh, 2017).

Generally, Malaysia's CPO production moved in tandem with planted area wherein CPO production increased by 7.5% or by 490 000 t annually, while planted area had increased by 5.7% since 1975 (Abdullah, 2014). In 1990, CPO production amounted to 6.09 million tonnes, increased further to 10.84 million tonnes and 16.99 million tonnes in 2000 and 2010 respectively, while planted area increased to 3.38 million hectares and 4.85 million hectares in the corresponding period (*Figure 2*) and (*Table 1*).

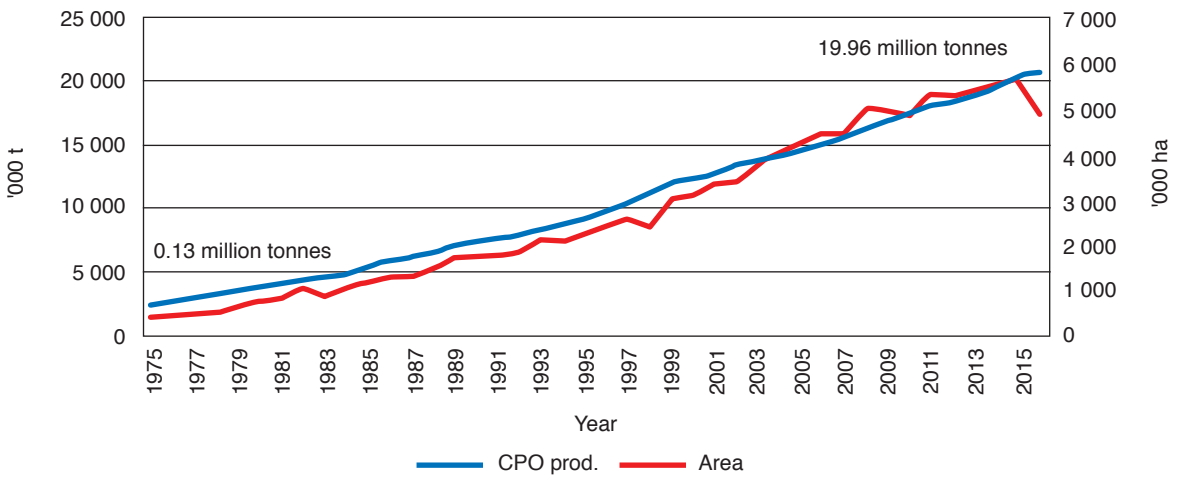
Yield

The FFB yield performance affects the CPO production. The oil palm starts producing FFB after three years of planting and reaching its maximum yield at the age of 12 to 15 years after which the yield, starts decreasing after the age of 15. Although the recommended age level for oil palm to be replanted is at the age of 26, the decision to replant will depend on a number of factors, *i.e.* the productivity of the oil palms, height of the oil palm, costs of production and the price.

Management and agronomic practices will affect the performance of FFB yield. Normally good agricultural practices will result in better performance of FFB yield and subsequently leading to a higher CPO production.

Although CPO production move in tandem with planted area, sometimes there are occasion when both production and planted area are negatively related. According to Ling (2012), one of the factors that affect production of palm oil is weather. As the oil palm being a rain-fed crop, its yield is influenced by any severe changes in the rain intensity and/or its distribution. Some important environmental stresses such as extreme rainfall or drought could have a great impact on crop productivity. *La Nina* or monsoon rain which normally refers to prolonged wet conditions, *i.e.*, heavy rainfall around eight to 16 weeks, brings the immediate effect to the CPO production. The immediate impact experienced refers to the disruption to FFB harvesting and logistics.

Rahman *et al.* (2013a), also concurred that weather affects Malaysia's CPO production. In 2010/2011, about 430 000 ha of oil palm estates were affected by flood and their FFB harvesting and collecting process were disrupted. The combination of *El Nino* and *La Nina* caused serious condition on FFB yield in 1998 whereby FFB production declined by 8.0% as compared to 1997. Meanwhile in 2009 and 2010, FFB production was down by 2.2% and 3.1% respectively. *El Nino* phenomena in 2016, which described by the economist as worse as in 1998 had also brought significant impact on FFB and CPO production (*Figure 3*). Despite increasing in planted area to 5.74 million hectares in 2016, FFB



Source: MPOB (2017a).

Figure 2. Malaysian oil palm planted area and crude palm oil (CPO) production (1975-2016).

and CPO production declined by 12.2% to 86.33 million tonnes and by 13.2% to 17.32 million tonnes respectively mainly due to the *El Nino* phenomena.

Palm Oil Stocks

Holding a sufficient stock at a certain quantity is important to meet demand at the time and the quantity required. It is important to ensure that there is no shortage of stocks when it is needed, either to meet existing contracts or to meet current demand. Previous study revealed that palm oil price and stock level has a negative relationship, but it showed a positive correlation with export demand. Palm oil stocks is a strong psychological factor to indicate Malaysian palm oil industry performance. Therefore, the monthly closing stock is one of the important criteria used in measuring palm oil market performance (Nordin *et al*., 2007).

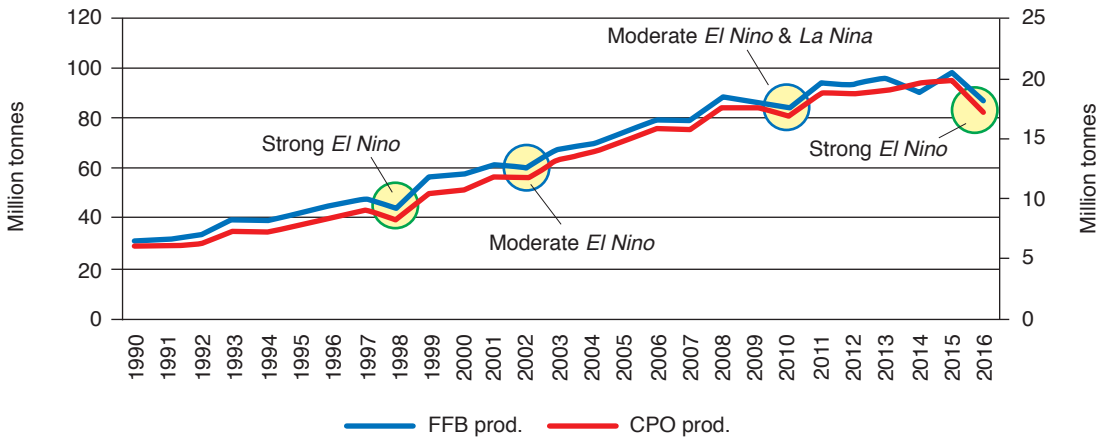
Generally, Malaysia's palm oil stocks showed an upward trend since 1996 (*Figure 4*). The increase in total stocks was in tandem with the total CPO production, the main contributor to the total palm oil stocks in Malaysia (Abdullah, 2013).

The total palm oil stocks had fluctuated from 0.35 million tonnes in 1980 to 1.67 million tonnes in 2016. The Malaysian palm oil stocks reached the highest level in 2012 and 2015 at 2.63 million tonnes while the lowest stocks ever recorded since 1980 was in 1983 at 0.19 million tonnes.

Exports

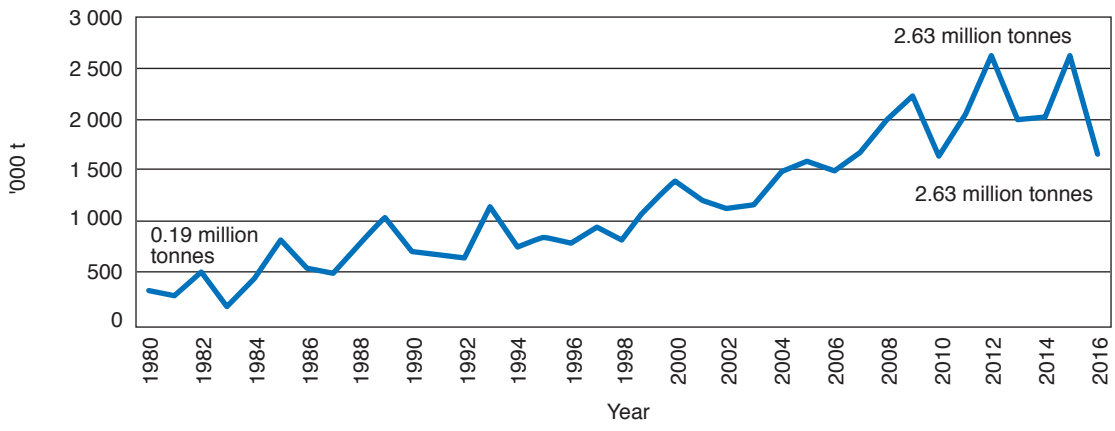
Malaysian exports of palm oil witnessed a significant growth, jumping from less than 100 000 t in 1960 to 16.05 million tonnes in 2016. The palm oil exports in 1960 was 90 500 t in which CPO was its main production during the period (Fold and Whitfield, 2012).

The Malaysian palm oil sector was an export-oriented industry due to the country's small population (Ming and Chandramohan, 2002;



Source: MPOB (2017b).

Figure 3. Fresh fruit bunches (FFB) production and crude palm oil (CPO) production (1990-2016).



Source: MPOB (2017a).

Figure 4. Malaysian palm oil stocks (1980-2016) ('000 t).

Alias *et al*., 1999), wherein annual palm oil exports accounted for close to 90% of its yearly production. Being an export oriented industry, the development of the processing industry is clearly dictated by the type of products export and exports destination (Fold and Whitfield, 2012). In 1975, with the establishment of palm oil refining (PORLA, 1999), the export volume of processed palm oil products exceeded that of CPO and slowly made up a large portion of exports at the expense of the latter (Fold and Whitfield, 2012) from only 0.22 million tonnes in 1975 surging to 2.07 million tonnes in 1980, up by more than nine-fold.

In 2016, exports of processed palm oil products stood at 12.22 million tonnes or 76.2% from the total Malaysian palm oil export (16.05 million tonnes). On the other hand, the decline in exports of CPO was significant from the early 1970s wherein it accounted for 70% of total exports as compared with less than 1% in1995 (Alias *et al*., 1999). In the early 1980s, CPO was no longer significant in total exports of palm oil products. Apart from that, in line with the growth in production technology, processed palm oil products have also gradually expanded and diversified from basic refined products into value-added products (Fold and Whitfield, 2012).

The diversification of palm oil exports was not only limited to the type of processed products as there was also notable changes in markets that took place. Initially being dominated by exports of CPO to developed countries, *i.e.* USA and the European Economic Community, exports of processed palm oil products have become significant and highly demanded in developing countries, primarily in the West Asia, South Asia and East Asia. In the late 1980s, about 75% of palm oil exports were destined to developing countries (Fold and Whitfield, 2012). Malaysian palm products are now being exported to more than 200 markets worldwide from merely depending on Europe and other developed countries as its main export destination in the early years (PORLA, 1999).

However, despite being exported to more than 200 countries globally, Malaysian palm oil is still dependent on few selected markets as a major exports destinations such as India, the European Union (EU), China, Pakistan, Egypt and Japan (Ming and Chandramohan, 2002). Except for Egypt, the other countries such as India, the EU, China, Pakistan and Japan remain as the largest Malaysia palm oil export market in 2016.

Imports

Imports of palm oil were undertaken as one of the ways to overcome the problem of surplus capacity of refineries that emerged in the late 1980s (Alias *et al*., 1999). Imports were mainly sourced from Indonesia because of its cheaper price and the latter had yet fully established its refining sector (Talib and Darawi, 2002; Alias *et al*., 1999). The rise in imports of CPO enhanced supply availability of CPO, thus leading to higher capacity utilisation in the refining sub-sector (Alias *et al*., 1999).

The problem of excess refining capacity existed with the expansion of the refining sub-sector of the industry that stimulated the development of downstream industry to produce and further expand the value-added products. The existence of excess refining capacity was partly due to the lack of co-ordination at the early stage between parties involved in approving the establishment and monitor the refineries growth. The limited expansion in domestic output due to problem in labour and land shortage also caused problem in excess refining capacity. Although the capacity utilisation rate had improved since 1992, the refining sector of the industry had yet to utilise its optimal capacity. The changes within the refining sub-sector triggered by market demand have also resulted in adding costs to the industry. Such costs could be avoided with large supply availability of CPO from local output and imports (Alias *et al*., 1999).

Price

CPO is traded in local and international markets. Factors that affect CPO price movement include supply and demand of palm oil, the price and demand of other vegetable oils, weather patterns, import policies of importing countries and changes in taxation and import duty (Rahman, 2013a). The changes in price can also be affected in short-term and long-term (Abdullah, 2013).

According to Fry (2009), palm oil sector can stimulate the Malaysian economy depending on the likelihood of price recovery. Since 1950 to 2006, the movement of real annual CPO prices in the EU fell by 2.3% per annum. It was found that there are four long-term challenges facing the palm oil sector, *i.e.* poor improvement rate in yields compared to other oil crops, low palm oil productivity, functional obstacles to palm oil use in temperate countries and lastly, the non-tariff barriers as against palm oil in export markets.

In addition, the price of substitute products like soyabean oil and rapeseed oil can influence the movement of palm oil price in world market (Chuangchid *et al*., 2012). Doak (1978) showed that price relationship between soyabean oil and palm oil from 1974 to 1977 (*Figure 5*). At mid-1975, major palm oil discounts largely disappeared by 1976 while premium prevailed during 1977 and 1978.

Higher demand for oil palm products will lead to competitive price. However, if the growth of palm oil supply is faster than the demand, price will be affected in a negative manner (Rahman, 2013b). Other studies indicated that

increasing demand and availability of palm oil have made the price of palm oil to be competitive against soyabean, rapeseed and sunflower oils (Abdullah, 2014).

Palm oil was traded at a price discount to other competing oils and the gap was dependent on supply and demand. In 1962-2002, the price discount was between as low as USD 2 t^{-1} to an extreme USD 157 t^{-1}. *Figure 6* shows that production increased rapidly in some years and had caused stock increase, thus pressuring palm oil price in the world market. In addition, policy decision in importing countries to implement higher import tariff on palm oil has also affected the price discount. However, palm oil remained cost competitive in many developing countries as compared to other oils (Basiron *et al*., 2004).

Figure 7 shows movement of oils and fats prices in the European market. This movement resulted from mismatch of supply and demand due to harvesting problem, changing in import tariff and increase in biodiesel demand (Abdullah, 2013).

According to Rahman (2013b), palm oil price movement also depends on CPO prices. Crude oil prices gave positive significant effect on palm oil price due to the implementation of B5 programme in 2007 (*Figure 8*) (Abdullah *et al*., 2007). The correlation index between palm oil price and crude oil price was 0.7428, indicated high correlation (Rahman, 2013b). Prior to 2007, changed in crude oil price did not influence the variation in edible oil prices (Yu *et al*., 2006).

Biodiesel Development

The extensive research and development on palm biodiesel in Malaysia has been carried out by MPOB since 1980s (Wei *et al*., 2010). The idea

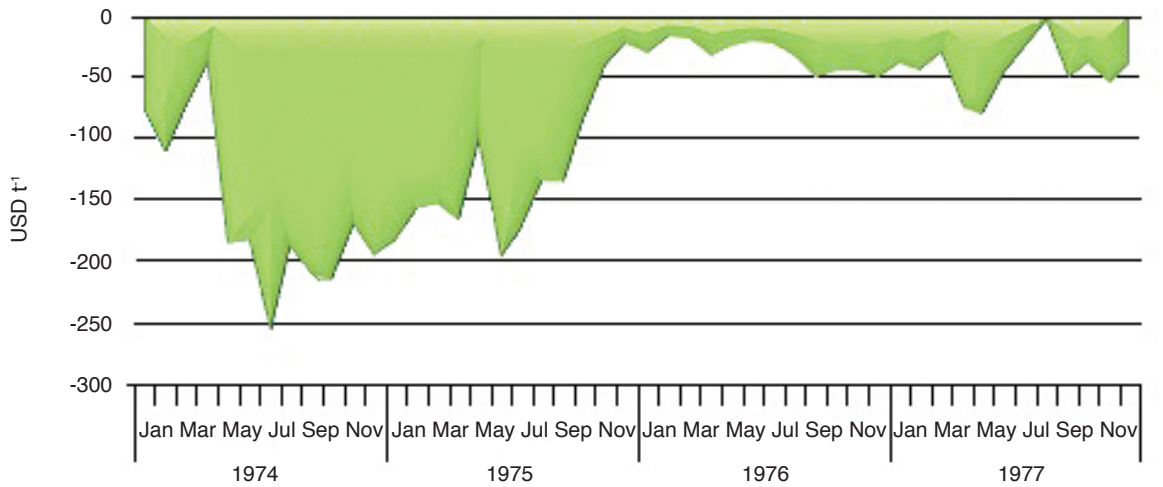
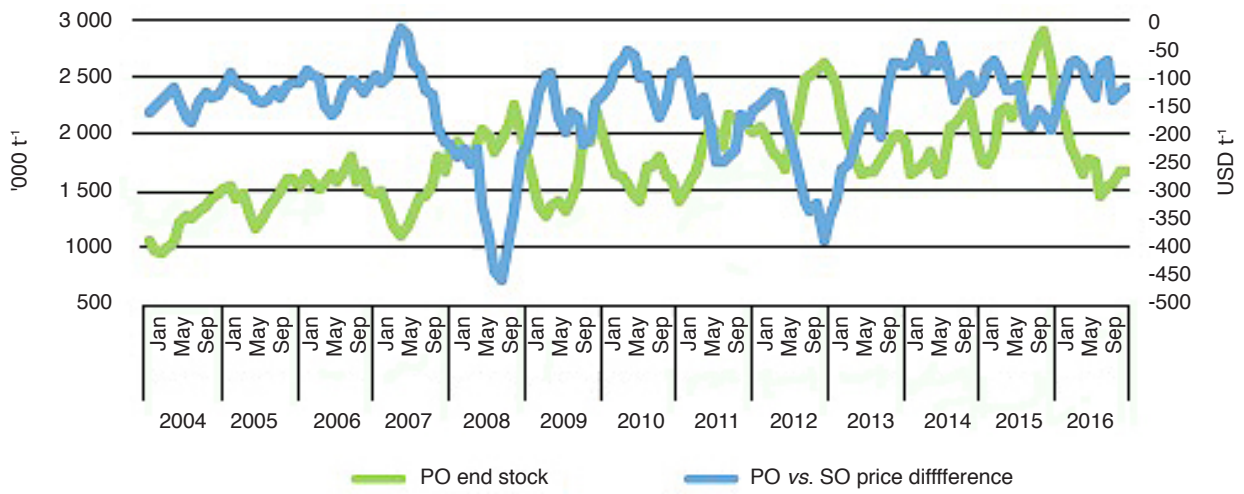
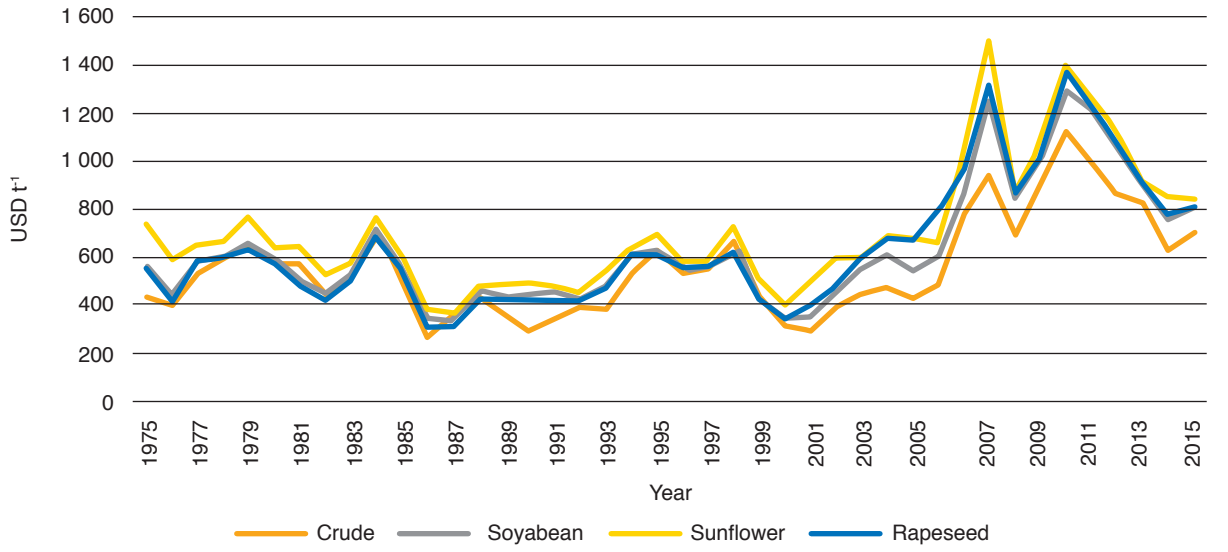


Figure 5. Palm oil and soyabean oil price discount (1974-1977).



Note: PO - palm oil.
SO - soyabean.
Source: UNCTADSTAT (2016), MPOB (2017a).

Figure 6. Relationship between palm oil stock and price discount.



Source: UNCTADSTAT (2016).

Figure 7. Price of oils and fats (1975-2016).

Source: UNCTADSTAT (2016).

Figure 8. Relationship between crude palm oil (CPO) price and crude oil (CO) price.

and research work pertaining to this was realised through commercialisation of MPOB-developed palm biodiesel technology on normal and winter grade biodiesel locally and abroad (Loh and May, 2013). In 2006, palm biodiesel project collaborated by MPOB-Carotino was commissioned, followed by MPOB-Sime Darby in 2007 and MPOB-Titian Asli in 2008 (MPOB, 2010). MPOB was also involved in commissioning the palm biodiesel plant in South Korea in 2007 and Thailand in 2008 respectively (MPOB, 2010).

The energy security concerns, targets for greenhouse gas (GHG) emission reductions and support for commodity prices are among the drivers for biodiesel in Malaysia. The interest in producing biodiesel also grew due to the EU and USA promoting the use of biofuels to meet the national renewables target (Loh and May, 2013). These two countries have a clear national biofuel programme and policies and also known as the leader in using renewable energy (Yusoff *et al*., 2013).

The Malaysian government launched the National Biofuel Policy in March 2006 (MPOB, 2010). As a platform for the biodiesel industry, this policy has five strategic thrusts namely the use of biofuel for transport, industry, commercialisation of biofuel technologies, export and cleaner environment (MPIC, 2006). This policy envisions the use of

biofuels for a cleaner environment and sustaining the commodity prices (Wahid and Chan, 2007). The Malaysian Biofuel Industry Act 2007 which came into force in 2008 regulates the development of Malaysian biodiesel industry (Johari *et al*., 2015). The Act includes prescribing the type of biofuel, licensing of biofuel activities and mandate for palm biodiesel (AGC, 2012).

Malaysia through its oil palm industry has good potential to become a renewable energy producer rather than only producing oil to feed the world (Loh and May, 2013). The palm oil is seen as a very highly sustainable biofuel feedstock compared to other first generation biofuel feedstock such as rapeseed, soyabean and corn (Yusof and Yew, 2013). However, the market risk concerning the fluctuation of crude oil and CPO prices as well as trade barriers give challenge to the biodiesel producers (Loh and May, 2013). Higher palm oil feedstock cost also contributes to less competitiveness of palm biodiesel to replace petroleum diesel (Lim and Teong, 2010).

The production and use of biodiesel from palm oil is more environmental-friendly as compared with petroleum fossil fuel (Wei *et al*., 2010). The quality of Malaysian palm biodiesel also meets the international biodiesel standards, *i.e.* ASTM D 6571 and EN 14214 (Masjuki *et al*., 2013). Nevertheless, the concerns about sustainability and environmental implications of palm biodiesel arise particularly in the EU (MPOB, 2010). The EU was the major destination of Malaysian palm biodiesel in 2016, accounted for 83.5% of total export (MPOB, 2017b). In this regard, both Malaysia and Indonesia, have voiced their common concerns to the European Commission (EC) on the issue of palm biodiesel as a sustainable renewable energy source (MPOB, 2010).

In Malaysia, the mandatory blending of B5 was implemented in stages beginning 2011 (Shri *et al*., 2014) and it was extended to B7 by the end of 2014. The government also plans to implement the B10 in the near future following the success of the B5 and B7 implementation (Ismailkuala, 2014). The biodiesel mandate had a positive effect on domestic demand of Malaysian palm oil (Shri *et al*., 2014). It shows the government's commitment in using palm biodiesel locally as a renewable energy that contributes to a cleaner environment (Yusoff *et al*., 2013).

Policy Changes

In Malaysia, the oil palm's upstream and downstream processing have enjoyed considerable government supports and figured prominently in various government policies especially through the implementation of Malaysia's Industrial Master Plan (IMP) (Rasiah and Shahrin, 2006). CPO was the main product exported until 1970s and at that time, taxation and incentive policies were introduced to encourage export of processed palm products (May, 2012). The focus had shifted from diversification and processing to expansion of exports by manufacturing starting from 1986 and strengthening of sectoral clusters from 1996 through the implementation of the Malaysia's IMP.

The First Industrial Master Plan (IMP1) was launched in 1986 that provided the framework for development of a broad-based manufacturing sector in Malaysia. The IMP1 outlines the transition from an agriculture and primary product-based economy to the manufacturing sector. The IMP1 identified 12 industrial sub-sectors that were to be developed with palm oil as one of the sub-sectors (MIER, 2006). The IMP1 emphasised on the rationalisation of palm oil refining and fractionation to increase efficiency and competitiveness in the global markets and as well as development of different segments of the industry in the value chain (Rasiah and Shahrin, 2006).

The Second Industrial Master Plan (IMP2) was launched in 1996 for the period of 1996 - 2005 to further develop the sector by strengthening industrial linkages, increasing value-added activities and productivity (Rasiah and Shahrin, 2006; MITI, 2006). It also to ensure an adequate and sustainable supply of raw material through imports. During this time, Malaysia's processing capacity exceeded the supply of CPO. The IMP2 was also extended to Sabah and Sarawak which offered incentives for labour-intensive and agro-processing industries located there. The IMP2 also stimulated downstream processing to increase value-added and focused on biotechnology (*i.e*., mass tissue culture, genetic engineering, cloning) as well as mechanisation (Rasiah and Shahrin, 2006).

The Third Industrial Master Plan (IMP3) which was launched in 2006 for the period of 2006 - 2020 to emphasise on the downstream manufacturing activities into wider range of highly value-added products through commercialisation of research and development and collaboration between government research agencies and the oil palm industry. During this period, in 2010, the Malaysian government introduced the Economic Transformation Programme (ETP) which comprehensively outlines a 10-year economic roadmap to energise Malaysia to become a high-income nation by 2020. The oil palm industry was given a new focus under one of the areas under the 12 National Key Economic Areas (NKEA) to drive the country's economy. Under NKEA, the palm oil sector is aimed at improving upstream productivity and increasing downstream expansion, while focusing on the sustainable development of the oil palm industry (May, 2012).

ISSUES AND CHALLENGES

Limited Arable Land

Malaysia has constraint in terms of new arable land available for palm oil. Currently, it is estimated that oil palm has been cultivated almost 52% of the total agricultural land (10.94 million hectares) in Malaysia. In the long-run, the country cannot afford the luxury of expanding oil palm cultivation. Therefore, the Malaysian companies especially Malaysian government-linked companies (GLC) companies have to go to other countries which have similar soils and climate where land are still plentiful and affordable like Indonesia, Papua New Guinea and those in central south America and possibly Africa.

Labour Shortage

Oil palm plantations are facing labour shortage problem. In 2016, it was estimated that the plantations shortage was about 39 000 workers and most of them were for harvesting and FFB collection as well as field works (manuring, weeding and pruning) activities. Shortage of labour especially for harvesting and FFB collection (shortage of 12 000 workers) can lose income to the government about RM 2.8 billion to RM 3.9 billion, if CPO prices are RM 2500 and RM 3500 t^{-1} respectively (Azman, 2013). In reducing the problem, the estate managements are encouraged to increase level of mechanisation since mechanisation has been proven to increase productivity and reduced the number of workers. Under the 11th Malaysia Plan, the government has launched the Oil Palm Mechanisation Incentive Scheme whereby estate owners are given a discount of up to 20% for purchasing selected machines to be used in plantations. Apart from labour shortage problem, the oil palm plantation is also heavily dependent on foreign workers. In order to attract locals, the government has implemented minimum wages, *i.e.* RM 1000 for Peninsular Malaysia and RM 920 for Sabah and Sarawak.

Negative Allegation on Palm Oil

Currently, the Malaysian oil palm industry is facing many challenges, allegations and negative perceptions by some NGO which insinuate that the development of the oil palm plantations is not sustainable, pollutes the environment and causes deforestation (Muthiah, 2017). Chin (2014) also reported that the negative campaigns against palm oil in western countries focusing on social, environmental and nutritional issues driven by misinformation. The government has taken proactive steps by introducing the Malaysian Sustainable Palm Oil (MSPO) certification scheme, which was introduced in 2015. The scheme will be made mandatory to the Malaysian oil palm industry from 31 December 2019 (Muthiah, 2017).

Health Concern on Palm Oil

According to Basiron *et al*. (2004), consumer health concerns are increasingly manifested in trade today in the form of food standards and regulations, including labelling requirements to keep the public informed. Non-tariff barriers are being erected against palm oil in many important export markets, most notably in the EU and USA. These barriers are linked to the issues of sustainability and life cycle GHG reductions in biofuel applications (Fry, 2009).

In March 2016, the European Food Standards Authority (EFSA) issued a report warning about the health consequences of 3-MCPD (3-monochloropropane 1, 2 diol), a co-contaminants created during the processing and refining of edible oils (Clemens *et al*., 2017). This had prompted many NGO to launch campaigns to remove products that contain high levels of 3-MCPD ester from their supermarket. MPOB had formed a special task force to address this issue and recommended the mitigations measures to overcome the problem (Ibrahim *et al*., 2016).

Policy Changes in Indonesia

Palm oil has two important characteristics in the Indonesian economy. First, palm oil is an important export commodity that provides export earnings and generates employment opportunities. Second, palm oil is the primary source for cooking oil, which the government considers 'an essential commodity' for the country.

The availability of palm oil at affordable prices is key to the Indonesian government's policy of maintaining economic and political stability (Hasan *et al*., 2001). During the early years, the main difference between the Malaysian and Indonesian policy initiatives was that the Malaysian policies were Export Oriented while the Indonesian policies were to encourage Import Substitution. Export Oriented policies encourage competition and therefore it is imperative for the industry to acquire scale and technical efficiencies and to innovate, which leads to dynamism. On the other hand, Import Substitution policies generate adverse incentives and rent seeking activities, which contribute to a moribund industry (Rasiah and Shahrin, 2006). Oil palm cultivation in Indonesia expanded at a tremendous rate in the 1990s because of Indonesian government's encouragement of foreign investment whereby trade and economic liberalisation as well as policy deregulation and debureaucratisation created a conducive investment climate. Investment in the

plantation sector was given priority since this is expected to increase the socio-economic standard of people in the rural areas. The inability of local private investors to raise all the huge financial requirements for oil palm development resulted in the inflow of foreign investments (Basiron, 2002). According to Rifin (2010), Indonesia is gaining competitiveness over Malaysia because palm products coming from the former are sold at lower prices than Malaysia coupled with aggressive marketing strategy by Indonesian exporters.

Beside Indonesia and Malaysia, there are smaller countries producing palm oil, *i.e*, Thailand and Colombia. However, these countries have less influence to global output and prices. Palm oil production in Thailand is about 2 million tonnes per year whist that of Colombia produces 1 million tonne per year (Commodity Basis, 2017).

FUTURE EXPECTATIONS

The adoption of mechanisation to address the issue of labour shortage and the production of superior yielding planting materials on a commercial basis to increase oil palm productivity is expected to be the key in ensuring the sustainability of the Malaysian oil palm industry. The operation of oil palm plantation in the future is expected to be more efficient and fully mechanised and automated. The use of drones, robotics, advanced sensors and digital technologies as well as user-friendly machinery and equipment is expected to minimise manpower requirements (The Star, 2017).

It is also expected that for the future, the increase in palm oil production will be made without clearing new land by producing superior planting materials which not only produce high yield but also resistant to pests and diseases as well as extreme weather conditions. Thus, the growth in production of palm oil will at the same time be in-line with the national policy of preserving 60% of its natural forest area.

In terms of carbon footprint, the emission of methane from mills will be utilised in producing renewable energy for use in running the mills and providing electricity to the national grid. The focus on water conservation through novel water capturing and storage technology, such as harvesting water vapour and storing excess water underground will strengthen the credentials of the palm oil industry (The Star, 2017). These will ensure that the industry has the lowest carbon footprint and lower GHG emissions.

On the issue of confronting negative allegations against palm oil, continued efforts in creating a distinguished Malaysian brand for palm oil as an environmentally sustainable palm oil through the mandatory adoption of the MSPO certification scheme throughout the value chain is deemed as the game changer for the industry in the future. It will then create a unique brand for Malaysian palm oil, thus positioning Malaysia as the preferred global supplier of edible oils for its highest quality and sustainability.

CONCLUSION

The Malaysian oil palm plantation sector has grown rapidly since it began to be commercially grown in 1917. The success of the plantation sector which is the backbone for the upstream sector has opened up opportunities for the downstream sector to grow rapidly. Over 100 years, various issues and challenges have hit the country's palm oil industry. However, all these issues and challenges have been successfully overcome wisely. Issues such as productivity, labour shortage, technology adoption and sustainability need to be addressed fully and in an effective manner in order to ensure that the industry will remain resilient in the future.

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